A DISCOURSE

Written to a

LEARNED FRIER,

BY

M. *DES FOURNEILLIS*;

SHEWING,

That the SYSTEME of M. *DES CARTES*, and particularly his Opinion concerning BRUTES, does contain nothing dangerous; and that all he hath written of both, seems to have been taken out of the First Chapter of *GENESIS*.

To which is annexed the

SYSTEME GENERAL

Of the same

CARTESIAN PHILOSOPHY.

By *Francis Bayle*, Dr. of Physick at *Tholose*.

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Me Alpin
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A DISCOURSE

Written to a Learned Frier, ſhewing that the Syſteme of M. Des Cartes, *and particularly his Opinion concerning* Brutes, *does contain nothing dangerous; and that all he hath written of both, ſeems to have been taken out of the Firſt Chapter of* GENESIS.

My Reverend Father,

I Know very well, that *Moſes* hath not written his *Geneſis* with a deſign to explain to men the Secrets of Nature; but I do alſo know, that being inſpired by God, as he was,

he could ſay nothing about the production of the World, which is not true. And therefore I eſteem, that to find the Principles of Natural Philoſophy infallible, they are not to be ſought but in that Hiſtory which He hath given us of the Creation of the World; or at leaſt, that we ought to eſteem falſe whatever is ſaid of Nature, when it cannot be reconciled with all the Circumſtances of this Hiſtory.

Do not wonder therefore that I ſo often refer you to *Geneſis*, and that I lay ſo much weight upon the Principles of Monſieur *Des Cartes*. Moſt of his Tenets are ſo conform to what *Moſes* hath ſaid, that it ſeems, he became a Philoſopher only by the Reading of this Prophet. But that you may the more eaſily apprehend how great an agreement

there

there is between that Sacred Writing and his Philoſophy, I intend to expound unto you the firſt Chapter of *Geneſis* literally; and you'l ſee, that in doing ſo, I ſhall diſcourſe to you almoſt the ſame things which I told you laſt, when I explained to you the Principles of M. *Des Cartes*.

The only difference you'l find is, that M. *Des Cartes* writeth things more particularly, and with a deſign to make them known what they are in themſelves; whereas *Moſes* writeth like an Hiſtorian, who diſcourſeth of Nature only ſo far as was needful to make us admire the power of the Author thereof. Thus the one ſpeaketh only of the principal things, and the other dives more into particulars; and yet all theſe particulars are clearly nothing elſe but a more

ample explication, and a Sequel of thoſe main things which *Moſes* hath recited in ſo conciſe, ſo bold, and ſo true a manner.

I told you the other day, that M. *Des Cartes* in the beginning of his Principles uſeth much reaſoning to ſhew, *That* there is a God: *That* all what is, is only by him: *That* he begun this great piece of Workmanſhip, which we call the World, by creating Bodies: *That* from that time he moved them, and that he ſtill continues to move them. I alſo told you, that among ſo many differences, which the *Figures* may make between Bodies, M. *Des Cartes* takes notice of three principal ones; that he ſhews, there is a very great Number, of ſuch as are round like little Balls; others, ſubtil enough to fill the ſpaces left by theſe Balls between themſelves;

ſelves; and others again, whoſe irregular Figures do ſo entangle them one with another, that they may compoſe the greater Maſſes.

I added, that examining the ſeveral changes, which the Matter or the Aggregate of all theſe Bodies may have ſuffered ſucceſſively, M. *Des Cartes* ſheweth, that there may have been formed many Maſſes of different bigneſſes, of a figure approaching to that of the Earth; above which he ſheweth, that there was to remain a number of particles, ſome like thoſe which compoſe the *Water*, and others like thoſe which compoſe the *Fire*: That this Aggregate of Earth, Water, and Air, was to be mixed, and ſurrounded with an almoſt infinite number of thoſe little Bodies made in the form of *Globules*, and with theſe other ſub-

tiler ones that were to fill up their Intervalls. And that, laſtly, M. *Des Cartes* repeats often, that God entertains in a continual motion this ſubtile matter, which elſe could not be moved.

Now all this, if you mark it, is nothing elſe, than to deſcribe Philoſophically and exactly (for the making out of the leaſt circumſtances of it) the ſame wonders which *Moſes* hath deſcribed Hiſtorically in theſe few Lines; *God created in the beginning Heaven and Earth. Now the Earth was void, and brought forth nothing, becauſe it was covered with deep waters; Darkneſs was upon the face of this Abyſs, and the Lord moved a ſubtil matter upon the Waters.*

He that ſhall well examine what

what the *Prophet* hath ſaid, will find that 'tis the ſame thing which the *Philoſopher* hath endeavoured to explain.

The First Day.

IF we ſhall follow the one in the progreſs of his Reaſonings, and the other in the progreſs of his Hiſtory; we may judge, that it is of *Moſes*, that *Des Cartes* hath learned, that the *Light* was made before the Sun; at leaſt it will appear, that this place of *Geneſis*, which for ſo many ages hath perplexed mens ſpirits, is found happily cleared, according to the Letter, by the Principles of M. *Des Cartes*.

Moſes

Moſes having ſhewed that the Earth was infertile becauſe of the Waters encompaſſing it, and the Celeſtial matter uſeleſs, becauſe the motions of it were not regulated; he goes on to ſhew, that God, who does nothing in vain, began, for the ordering of all theſe things, with the Creation of *Light*: He expreſſeth himſelf magnificently, as he is wont to do; and maketh the Almighty ſpeak on this occaſion in ſuch a manner, which is capable all alone to perſwade, that it is the Lord himſelf that made him ſpeak thus.

Behold his Expreſſions; *And God ſaid, Let there be Light, and there was Light.* He adds, That God ſaw, his work was good; that he divided the Light from the Darkneſs; and that he gave the name of *Day* to the Light, and

and the name of *Night* to Darkneſs.

There is no man of good ſenſe, who ſees not, that *Moſes*, having declared, that in the beginning God created Heaven & Earth, & that certain Bodies, ſubtil enough to be called Spirits, were carried to and fro, does ſignifie, that all the Bodies were already created; and that God did maintain from that time in the whole maſs of matter as much motion, as he conſerves in it now; and that what he hath made in all the following ſix dayes, was only to put thoſe Bodies in order, and to regulate all their motions.

So that, if ſpeaking like an Hiſtorian, *Moſes* hath marked out the firſt day of this admirable Contrivance by the formation of Light, this ſignifies only to us, that God diſpoſed the Bodies

dies, as they ought to be, to produce this wonderful effect; which was ſufficient for an Hiſtorian; but the Philoſopher was to make it out, how theſe Bodies were to be diſpoſed for that purpoſe.

Wherefore chuſing from among all the Figures thoſe, which might be moſt proper for the little Bodies which cauſe Light, and ſeeing that thoſe, which he had deſcribed as *Globules*, being moved in a certain manner, would be ſatisfactory to all that is known of the Rayes which are made by the Light; M. *Des Cartes* hath ſuppoſed, that there were formed divers *Vortexes* or *Whirl-pools* of theſe little round Bodies, and that many of them turning round about one and the ſame Center, a part of the matter, which fills up their Intervalls, was gathered towards the Center, whence it did

did propel the *Globules* which ſurrounded it; ſo that this preſſure of the *Globules* made Light in all thoſe places, where was found a ſufficient conflux and heap of ſubtile matter.

But he adds, that as in this beginning there was not yet a great plenty of theſe more ſubtil parts in the Centers of the Whirlpools, the action, which preſſed the *Globules*, did not reach far; ſo that the places, which its effect could not reach to, remained in darkneſs, whilſt the other were already enlightned: which agreeth admirably with the effect, which *Moſes* aſcribeth to the firſt Word of the Lord, which did ſeparate the Light from the Darkneſs, from the time it began to form it: From thence alſo we may ſay, according to *Geneſis*, that the Night was where the Darkneſs had

had remained; and the Day, where the Light had begun.

You will obſerve, that by the Word *Light*, we are here to underſtand nothing elſe but that, which is the cauſe, that the Bodies, called Luminous, excite in us the ſentiment,, which makes us perceive them, and not the ſentiment it ſelf.

Men do often confound theſe two things, and 'tis certainly from thence that all the doubts proceed that are met with on this Subject. But me thinks, that in what *Moſes* hath written of Light, 'tis evident, that he would only ſpeak of what is found on the part of the Bodies, and not of the Effect which it produceth in ſuch Subjects as are capable to have the ſenſe of it; ſince it is certain, according to *Moſes*, that when that, which is called Light, was

was created, there was yet none of the other Creatures which are eſteemed capable to perceive it.

I deſire you to obſerve by the by another thing, which is; That this ſentiment, which we have from Luminous Bodies, is in ſuch a manner on the part of our Soul, and hath ſuch a neceſſary reſpect to the motion of certain parts of our Brain, that very often, without the excitation of the nerves of our Eyes by any Luminous body, we have the ſenſe of Light. Thus in Dreams, the fortuitous courſe of the Spirits moving thoſe parts of our Brain, the agitation whereof is deſigned to excite in us that ſentiment, maketh us clearly ſee Objects that are not preſent: And by the ſame reaſon thoſe, who marching in a very obſcure place hurt their

head

head againſt the Wall, are ſubject to ſee a thouſand Fires; whence we are to conclude, that thoſe motions of the Brain which have nothing that reſembleth the thoughts which ariſe in the Soul on their occaſion, may be excited by other Bodies than thoſe we call Luminous. But it was very proper, not to give this name but to Bodies, whoſe figure and motion were ſo proportionate to the fineneſs and tenderneſs of our Eyes, that their nerves might be moved by them without pain, and without danger to the other parts of our Body. Wherein, me thinks, M. *Des Cartes* hath ſucceeded admirably well; it being not poſſible to aſſign to Luminous Bodies a fitter Figure than that which he hath given them, nor a motion more convenient, than that which he hath aſcribed to them. The

The Second Day.

Moſes relating what paſſed the Second Day, for the formation of the Firmament, expreſſeth himſelf in theſe terms; *God ſaid, let the Firmament be in the midſt of the Waters, and let it ſeparate the one from the other.* He adds, that the Firmament was preſently made, and the Waters were ſeparated from the Waters, ſo that there were ſome of them above and ſome under the Firmament, which he called *Heaven.*

To underſtand how the Waters were ſeparated one from the other by the formation of the Firmament, according to the ſentiment of M. *Des Cartes*, we ſhall

need only to relate what he teacheth of the Waters and of the Firmament.

Thoſe who have read what he hath written thereof, do know, that after he had conſidered all the effects of Water, he conceived that the particles, which compoſe it, muſt be ſmooth, long and pliant; and that by this ſuppoſition alone he hath rendred a reaſon of all what is obſerved in Water, whether it be running, or whether it enlarge it ſelf in a Veſſel, or whether we ſee it in drops, or in the form of a Scum, or whether it riſe in Vapours, or whether, remaining without motion, it appear in Ice or Snow.

We know alſo, that he ſuppoſeth, that there hath been a great number of theſe particles very ſmooth and very pliant, mingled with other bodies, a great part of

of which had figures ſo embaraſſing, that their Aggregate could form no other but hard Maſſes.

Laſtly, We know, that he ſuppoſeth theſe laſt particles have been the matter of many Maſſes almoſt like the Earth; and foraſmuch as theſe Maſſes could not be very ſolid & very hard, but by an extream preſſing of the Branchy particles which compoſe them, it is evident, that the particles of water which were mixed therewith, were driven out of it, and that ſo the ſurfaces of thoſe great Maſſes were to be altogether covered with it.

This being ſuppoſed, it is now to be obſerved, that, according to M. *Des Cartes*, the formation of the Firmament is nothing elſe but a perfect diſpoſition and ranging of all the Whirlpools, of which I have already ſpoken in

the Subject of Light: Their number is ſo great, and the ſpace they fill ſo vaſt, that the word *Firmament*, according to the trueſt interpretation, ſignifieth a vaſt extenſion. There is nothing that deſerveth more this name, than their Aggregate. But as we ought to mark the time of the formation of every thing, only from the moment which giveth it its perfection; M. *Des Cartes* having ſuppoſed, that the Aggregate of all the whirlpools was not yet well ordered, when the Light began, nor their motion very free, doth mark the time of the formation of the Firmament, then only, when they were ſo well adjuſted, that the Ecliptick of the one anſwering to the Poles of the other, they began to move among themſelves with a motion altogether free, and ſo proportioned,

tioned, that not any one received a Let from all thoſe, which encompaſſed it.

'Tis at this inſtant, that, according to *Des Cartes's* Hypotheſis, the Maſſes, which were in the ſame *Vortex*, where the Earth was, began to be ſeparated from it by the matter of that *Vortex*, which inſinuated it ſelf betwixt them, and which kept them more or leſs diſtant from the Center, according to the difference of their groſsneſs or ſolidity. Now, as we have noted, that they were all covered with their Waters, and that the matter of the *Vortexes* (which, according to this Doctrine, is the matter of the Firmament) ſeparated them from the Earth, it was true to ſay, following the ſame Doctrine as well as that of *Geneſis*, that the Waters were ſevered from the Wa-

 ters,

ters, by the formation of the Firmament.

Thus M. *Des Cartes*, who ſeems always to follow *Moſes*, diſpoſeth the Waters ſo, that they are ſome above, and ſome under the Firmament. For we know, that what the Prophet calls in this place *Under*, is the Earth we inhabit; and all that is ſevered from it by the Celeſtial matter, may be ſaid, in reſpect of us, to be above the Firmament.

I do not explain this more at large, nor do I examine, how well theſe different Conſervatories of Waters, which M. *Des Cartes* placeth in ſeveral parts of Heaven, do repreſent thoſe Cataracts, whence the Lord drew forth, at the time of his wrath, what ſerved to overwhelm the Earth.

Neither do I make reflection upon

upon the Changes, which have happened to the Earth by this ſuper-abundance of Waters. This is perhaps the cauſe of the Clouds, Rains, and the firſt apparition of that admirable *Phænomenon*, which the Lord made uſe of to ſecure *Noah* againſt the apprehenſions of a new Deluge, when he promiſed him to ſhut up for ever thoſe Cataracts, which he had opened for his vengeance; but this would carry us too far.

The Third Day.

THe *Third* Day *Moſes* obſerveth, that, the Waters covering the Globe of the Earth, it was convenient to gather them together into certain places, to the end that the other parts thereof remaining diſcovered, the Earth might produce Herbs, Plants and Trees of all kinds. He ſaith, that the ſame word, which had operated the wonders of the precedent days, wrought that alſo. To which he adds, that what appeared dry, was called *Earth*, and the collection of the Waters, *Sea*.

Now it is evident, that if the Earth

Earth had remained perfectly round, the waters could not have been gathered into places, to leave others dry. We muſt therefore believe, that the ſame day, which ſaw the ſeparation of the Waters from the Earth, ſaw alſo the formation of the Hills, and that certain parts of the Earth being raiſed above others, left Vallies betwixt them for Beds to the waters, and Cavities under their Elevations, to receive a quantity of water, approaching to that which ſhould appear no more. 'Tis thus, that M. *Des Cartes* explicateth the matter. He declareth alſo, how the Earth was enabled to produce herbs, plants and trees, and how the different Juices, which run within the boſom of the Earth inſinuate themſelves into ſeveral Seeds, whoſe pores are adapted to their figure.

I desire you in this place to observe, that *Moses* saith not, that God made any *Soul* for Plants; he only saith, that the Earth, rendred fertile by the word of the Lord, did produce them. But those Philosophers who have alwaies had recourse to Souls, when they would explicate the effects of certain Organical Bodies, of which they could not discover the Springs, have given one to every Plant. They have believed, that it was impossible, to give an accompt of Vegetation without it. But M. *Des Cartes*, without adding any thing to the Scripture, where *Moses* speaketh of Plants, of their Seeds, of their increase and fruit without speaking of any Soul, hath believed, there needed none to be supposed to give a reason of their Nutrition; and he hath so clearly

ly

ly ſhewed, that Vegetation is performed by the local motion of the parts which come in afreſh, and by the fitneſs of their figure to the pores of that plant, which they are proper to increaſe, that I think I may aſſure, that there is none, how little ſoever accuſtomed to Ratiocination, but will acknowledge, after he hath examined what he ſaith on this Subject, that there remains not the leaſt probability to maintain, that Plants have Souls.

Yet you know, that there are yet ſome who will defend, that there are *Vegetative* Souls. But what, I pray, can authorize them? Not Reaſon ſurely. *That* tells us all, that things ought not to be multiplied without neceſſity; and ſince we do manifeſtly ſee, that Figure and Motion may be the entire cauſe of Vegetation,

we

we ought not to no purpoſe have recourſe to Souls. Nor can it be the Authority either of Man, or of the H. Scripture; for that of Man cannot be conſiderable againſt the evidence of natural Notions, and againſt the Experiments by which this Errour is convinced. As to that of Sacred Writ, it is manifeſt, that that is not on their ſide, and nothing appears there that may come near to what they would attribute to Plants, *viz.* a Vegetative Soul.

The

The Fourth Day.

THe *Fourth* Word did form two great Luminaries in the Firmament, to divide perfectly the Day from the Night, and to mark the difference of Dayes, Seaſons and Years. The ſame Word formed alſo the Stars, according to the Hiſtory of *Moſes*.

M. *Des Cartes* explaining this as a Naturaliſt, ſaith, that the ſeveral *Vortexes*, which had been formed of all the Celeſtial matter, having been adapted to one another, as was moſt convenient for the continuation of their motions, there flowed ſo much of the moſt ſubtil matter towards the

the Center of each of them, by the preſſure of the *Globules*, which tended to recede from it, that at length each of the Whirlpools came to have in his middle ſo great a quantity of this matter, that it was able to propel the globules to the extremities of the Whirlpool, and by this action to form ſuch Rays, as thoſe are, whoſe force makes us ſee the ſhining Sun.

He adds, that this ſubtil matter, gathered at the Center of each *Vortex*, may have force enough to thruſt the Globules of the Neighbouring *Vortexes*, and to make there its action ſenſible. So that, according to this Author, the ſhining collection of ſubtil matter, which was made in the Center of this *Vortex* wherein was the Earth, was, in reſpect of it, the greateſt Luminary,

nary, that is, the *Sun*: Thoſe that were made in the other *Vortexes*, were *Stars*; and *that* of all the great Maſſes, which was found neareſt, and moſt diſpoſed to propel towards it the Light of the Sun, was the leſſer Luminary, that is, the *Moon*. I ſhall ſay no more of it; and 'tis ſo well known, that the difference of Dayes, Nights and Seaſons comes from the different ſituation, wherein the Earth, the Sun & other Stars are found, that I ſhould be tedious to repeat here what M. *Des Cartes* hath written on this Subject.

The

The Fifth & Sixth Day.

THe *Fifth* Day God ſaid; *Let the Waters produce the Moving Creature that hath a living Soul, and Fowl that fly above the Earth.* And the *Sixth* Day he ſaid, *Let the Earth bring forth the Living Creature after its kind, Cattel, and creeping things, and Beaſts of the Earth.* I do not add the reſt; for it is enough to ſay, that God would have it ſo, to let men know, that it was ſo.

This Place teaching us, that if it may be ſaid, that Fiſh and the other Brute Animals have Souls, theſe

theſe Souls are produced by the Waters and the Earth; M. *Des Cartes* had reaſon to believe, that what is here called Soul, is nothing elſe but little Bodies ſo adjuſted to the Organs of Fiſhes and other Brutes, that they make them live, move and grow.

He hath admirably explained upon this Subject the Circulation of the Bloud; the manner *how* it is heated in the Heart; *how* it runs into the Arteries, whoſe different pores let out the particles, which their figure maketh fit for the nouriſhment of the Members; and *how* the fineſt parts of all extricate themſelves from the reſt, to go to the Brain, whence they are diſtributed into Muſcles, where they ſerve for the motion of the whole Body.

He doth give ſuch an accurate accompt of all theſe things only

by the figure and the motion of the little Bodies, and the disposition of the Organs, that there can remain no doubt of them. And that it may not seem a wonder, what he saith of the heat of the Bloud, which he maketh the chief Spring of all those Functions, commonly called Vital and Animal, he proves, that they must necessarily be performed by Bodies, without the need of any Soul; adding to his Reasons the example of certain Liquors, which are cold to the touch when they are asunder, but grow presently hot, even to a degree of ebullition, when they are blended together. As this effervescence happens to Liquors, which are not so much as suspected to have Souls, M. *Des Cartes* hath, me thinks, advanced nothing but what is rational, when he saith,

That

That the heat of the Bloud, joined to the disposition and the dependance of the Organs, is able without a Soul to cause the nutrition and motion of Brutes.

Me thinks also, that he had reason, since, what the *Vulgar Translation* calls a *Living Soul*, was produced by the Waters and the Earth, to believe, that this kind of Souls were only Bodies. And indeed there are so many places, whereby we may know, that this was the meaning of *Moses*, that 'tis a wonder to me to find men still doubting thereof.

I should tire you to recite them all to you; let me only desire you to reflect a little on *Lev.* 17. 11. where you will plainly find what it is that enlivens Flesh and Beasts; *The Soul of all Flesh is in the Blood.* The same saith M. *Des Cartes.* But *Dent.* 12. 23. *Moses*

expreſſeth himſelf yet more clearly, to make us underſtand, that Beaſts have no other Souls than the Bloud: *Only be ſure that thou eat not the Bloud: for the Bloud is the Soul.* And that it might be yet more underſtood, he adds; *And therefore thou maiſt not eat the Soul, but ſhalt pour it upon the Earth as water.* Is there not then all the reaſon in the world, that thoſe Souls, which the earth produceth, which may be eaten, and poured out upon the earth as water, ſhould be counted among Bodies?

I grant indeed, that the bloud, when it is heated, is exhaled in very ſubtil parts, and that theſe fine parts are thoſe, which do nouriſh and move. But how ſubtil ſoever they be, they are Bodies, and they have nothing more of ſpiritual in them, than flame,

flame, compoſed of parts yet more ſubtil, which yet never any man was ſo unadviſed as to call ſpiritual.

I wonder for my part, that thoſe who have given Souls to all that is nouriſh'd, have given none to a Flame, which converts into it all the bodies it lays hold on. And (what is more) I wonder, how men could come to attribute to Souls the cauſe of Nutrition and Motion, whereas we ſee nothing but Body that is capable to be moved, and that Nutrition is nothing elſe but an addition of Bodies to Bodies. But without inſiſting ſo much upon Ratiocination, is it not viſible, that *Moſes* (who certainly ought to be believed) acknowledges no other thing for the cauſe of the motion and nutrition of Beaſts, but the bloud? I think not, that any man, who

conſiders it, will contend about it any longer.

But that you may the better know the force of all theſe paſſages, which hitherto I have only taken according to the *Vulgar Tranſlation*, and which, according to this verſion, leave no difficulty, although the word *Soul* have been there employed; I ſhall now make uſe of a means, which wil prevail upon your ſpirit, and better perſwade you than any other.

You know more than one Language; and among others you know the *Hebrew*, which I underſtand not. I ſhall tell you then, that a while ago, reflecting on that place of Scripture, where is deſcribed the work of the Fifth, and that of the Sixth Day, there appeared to me ſo great a difference betwixt the manner, in which

which the formation of Brutes, and that of Man was made, that I believed, what word ſoever was uſed in the *Vulgar*, there muſt be uſed very differing Expreſſions in the *Hebrew*.

I ſaw, that the *Vulgar* ſaid, that the Beaſts have a *Living Soul*, and that the ſame Tranſlation uſed the ſame word to ſignifie the *Life* of Man: But I found withal, that beſides that living Soul, which the *Vulgar* gives to Man, as it doth to Brutes, 'tis added, that Man was made to the Image of his Maker, whom I knew to be a pure Spirit. Whence I concluded, that ſince this Reſemblance could not be drawn from the Body, the Creator having none, it muſt needs be taken from ſomething of a ſuperiour order, and, in a word, from the Spirit. To this I added, what the *Vulgar* ex-

preſſeth, ſpeaking of Man in the Second *Chap.* of *Gen.* Where I ſaw, that the Lord, who had made him a living Creature, as the Beaſts, had breathed into him ſomething which Beaſts had not, and which, me thought, ſhould be in him the Principle of a Life altogether different from theirs, and the cauſe of that advantageous reſemblance, which he was to have with his Maker.

All theſe things did already ſway much with me for the advantage of Man; but believing that I might yet better diſcover the ſenſe of thoſe places, by getting the Interpretation of the *Hebrew*, I conſulted Monſieur *de Compiegne*, who is known to be the ableſt we have in this Language. I prayed him to give me the Verſion of the firſt and ſecond Chapter of *Geneſis*; and in this

this Verſion I found the full proof of what I always thought, and of what M. *Des Cartes* had written on this Subject. For I ſaw, that in the place, which ſpeaks of the Production of Fiſhes and other Brutes, where the *Vulgar* ſaith, Let the Waters and the Earth bring forth *Living Souls*, my Interpreter ſaid, Let the Earth and the Water produce Living *Individuals*: which carrieth with it a very good ſenſe, and expreſſeth the thing in a far more conceivable manner: For, it is very intelligible, that the Earth and Waters have produced living *Individuals*, that is, that they have been ſo fitted and diſpoſed by the Almighty hand of the Lord, as to form Organical Bodies, which being fit for Nutrition and Motion (in which conſiſts all the *Life* of Bodies) were

to

to be called *Living*; but forasmuch as they could not be divided without being quite destroyed, were to be called *Individuals*.

Secondly, I see in the place which speaks of the formation of *Man*, that not only he was formed out of the Earth by the hands of the Lord, and that thereby he was become a *Living Individual*, as Beasts are; but above that, I see, that besides this Individual or Body Organick, which maketh him feed & move like Beasts, he hath received another thing, which my Interpreter calls *Mens*, and which I call Spirit, or Thought.

So that, as there is nothing spoken of a Soul for Plants in the Vulgar (as I have already observed) so there is neither in the *Hebrew* for Brutes. Neither is it said,

ſaid, that Brutes have *Senſe*, (which I alſo deſire you to note) but this only is ſaid, that they have Life and Motion. And becauſe this Life and this Motion do depend upon the diſpoſition and correſpondence of many Organs, the *Diviſion* of which would hinder the effect; *Moſes*, to ſignifie this Aggregate by one word, uſeth that of נפש, which ſignifieth *Individual.*

But that, which we ought to conſider above all, is, what the ſame ſacred Writer ſo well declareth; *That* Man hath a Body organized as Brutes have, and *that* this Body liveth by the ſame Principles which give life to Brutes; *that* having ſaid, that the *Individuum* of every Beaſt was produced by the Waters and the Earth, he ſaith, that that of Man was alſo produced of the Earth.

Earth. And to make us understand, that this duſt of the earth, which before was diviſible without danger, was ſo diſpoſed that it became an *Individual*, as every one of the other living bodies; he expreſſeth himſelf by the ſame word he uſed ſpeaking of Beaſts; and at the ſame time adds, that the Lord inſpired into this living Individual, of which he would make a man, that which he expreſſeth by the word נשמה, that is, a *Spirit*, or *Thought*.

This ſeems to me ſo ſtrong, that I think there can remain no more ſcruple about this point, *viz.* what we are to believe henceforth of Brutes and of Man. *Moſes* hath given us clearly to underſtand, that Brutes live and move, becauſe the Bloud and the contrivance of their Organs maketh of each of them an Individual

Body

Body, which remains fit for thoſe two effects, as long as that contrivance laſts: And why ſhould we attribute any other thing to them but this individual body, by which an accompt can be given of their Life and Motion?

But then, *Moſes* ſaith not, that they have *Senſe*. Why ſhould we deviſe, that they have any? Or, at leaſt, what danger is there to aſſert, that they have none?

Laſtly, this Man, inſpired by God, teacheth us, that the Brutes have nothing but what a Body may have, and that we have a body as they. But he adds, that we have beſides a *Spirit*; or, if you will, a Soul, which we know is alone capable of having ſenſe, of judging, of willing, and of all the other wayes of *thinking*. Why then ſhould we not aſſert, that the brute Animals have nothing but

but Body, and that they have no ſentiment? And why ſhould we not affirm, that beſides a body, like unto that which they have, (which maketh us not reſemble our Maker) we have a Soul, which giveth us that admirable advantage to reſemble him as much as a Creature is capable to do?

If after all this you ſhall ſtill tell me, that the opinion of M. *Des Cartes* is dangerous, in that it maketh Brutes live and move without a ſoul; I ſhall anſwer you, that then the Hiſtory of *Moſes* is dangerous, foraſmuch as it teacheth us the ſame thing.

But if, after you have ſeen, how well *Moſes* doth ſeparate that in Man, which maketh him *live* and move, from that which maketh him *think*, you ſhall examine, how the Creed of S. *Athanaſius*, which we read every day

as

as the Symbol of our Faith, defineth *Man*, you'l ſee, that he ſaith, that the Fleſh, and the Rational Soul make all what he is: To which he adds, that, as theſe two ſubſtances, how different ſoever they be, conſtitute but one man; ſo God and Man make but one and the ſame Chriſt. But as in our Lord *Jeſus Chriſt* it is not allowed, whatever the Union of his two Natures be, to confound them ſo, as to attribute to the one what comes from the other; ſo there is alwayes great danger to confound in Man the two Subſtances which do compoſe him, and the Functions which depend from each of them.

Thoſe that give to the Body ſentiment or other perceptions, which cannot belong but to the Soul, are ſubject to believe, that Man, as a Beaſt, hath nothing but

but Body. On the other hand, thoſe who think, that the Soul is that which cauſeth Nutrition and Motion in Man, are liable to believe, that the Beaſts, which feed and move, have a Soul as Man hath; and when there is no other difference betwixt Souls than that of *more* or *leſs*, there is an Axiom, which ſaying, *That more or leſs changeth not the Eſſence*, maketh, that Men will ſoon accuſtom themſelves to believe, that if all periſheth in Beaſts by death, there remains alſo nothing in Man, when he hath loſt his Life.

As for me, I doubt not at all, but what hath been ſaid of Vegetative and Senſitive Souls, which are attributed to Plants and to Beaſts, hath made impious men believe, that thoſe which are given to men, may be of the ſame nature.

If

If my Diſcourſe were not too prolix already, I could explain to you the moſt wonderful operations of Brutes by the ſole Conſtruction of their Organs, as all the operations of a Watch are made out to you by the contrivance of its parts; and ſhew you, that there is no difference betwixt Artificial and Natural Engines, but in this, that the Author of Nature is a far more excellent Artiſt than Men are, and that he hath known to apply ſuch parts to one another, as are much ſubtiler and much nimbler than thoſe are of which we commonly compoſe our Machines. I could alſe demonſtrate to you, that there is nothing known to us in Brutes, even in the *Ape* it ſelf, which may not be explicated from Bodies; and that in Man there are *Thoughts*, which all the

diverſities imaginable in Figures and Motions cannot give an accompt of. But I ſhould exceed the Bounds I have preſcribed to my ſelf, and it ſufficeth me to have ſhewed you, that M. *Des Cartes* hath alwayes followed *Moſes*, to make you aver, that his Philoſophy contains nothing dangerous.

Mean time I ſhall acknowledge, that the formation of the World according to M. *Des Cartes*, ſeems to have ſomething different from that of *Moſes*. But when you ſhall have conſidered the Deſign of the Prophet, and alſo that of the Philoſopher, you will confeſs that this difference ought not to make us ſay, that they have receded from one another.

Moſes hath delivered the thing as 'twas done. He ſaith, that God created the Earth, the Waters, the

the Celeſtial Parts, then the Light, and the reſt; ſo that, when the Sun was created, the Earth was already inriched with Fruits, and adorned with Flowers. Whereas M. *Des Cartes* maketh the Sun the Cauſe, not only of the Fruits, and Flowers, but alſo of the gathering together of many inward parts of the Earth. The ſame alſo maketh the Earth to have been formed a long time after the Sun, although the Scripture noteth, that it was created before.

But here we are to take notice of 2 things: The *one* is, that M. *Des Cartes* hath ſaid himſelf, that his Hypotheſis was falſe in this, that he ſuppoſeth that the formation of each Being is made ſucceſſivly; aſſuring, that this way not being ſo proper for God, we are to believe, that his Omnipotency hath

put every thing in the moſt perfect condition it could be in, from the firſt moment of its production.

The *other* is, that M. *Des Cartes* was, like a Philoſopher, to explicate only the reaſon, why things are conſerved as they are, and the different effects we now admire in Nature. Now, as 'tis certain, that things are naturally conſerved by the ſame means which hath produced them; ſo it was neceſſary for to find, whether the Laws, which he ſuppoſeth Nature follows to conſerve her ſelf, are true, that he ſhould examine, whether the ſame Laws could have diſpoſed it as now it is: And finding, that according to the Hiſtory of *Moſes* it ſelf, although the Sun was formed after the Earth, it is yet by the Sun, that God conſerveth the Earth as

now

now it is, the heat thereof being cauſe of all the Productions and Changes therein; M. *Des Cartes* was to ſhew, that this ſame Sun could have put it into that ſtate we now find it in, if the great Creator had not put it there in an inſtant by his Omnipotent power.

'Tis true indeed, that the manner, in which M. *Des Cartes* deſcribeth, that the Sun hath diſpoſed the Earth, is ſucceſſive, which he acknowledgeth (as I have already noted) to be not ſo ſutable to God in producing things: But however, as that which God doth in conſerving the World, is ſucceſſive, and muſt be ſo, that every thing may have a certain duration; it was proper for our Philoſopher to examine, whether the Principles which he laid down to give an

accompt of the duration of all Natural Beings, could have produced them by ſucceſſion of time; which he hath done with an exactneſs, which ſeems to me incomparable. And ſo M. *Des Cartes* hath therein done nothing, contrary to the Deſign of *Moſes*.

Moſes knew, that 'tis by the Sun that God conſerveth the Earth and the Natural Beings, thoſe at leaſt which are neareſt unto us; but leſt it ſhould be thought, that that Luminary was the cauſe of all, he would have us know, that *Light*, which depends moſt of all from the Sun, was made before the Sun. And this was neceſſary to give notice of to thoſe who were to know theſe Wonders, that God hath wrought them all by his ſole will; and if he conſerveth them now with

with a kind of mutual Dependency, yet they do not owe their Being nor their Conſervation to one another, but to God alone.

M. *Des Cartes* on his part, being to explain that correſpondence, which God hath put between the things of Nature, and being to give an accompt by the Sun of all that is done in that part of the World which is moſt known to men, could not better declare to us, how well the Sun is fitted and diſpoſed by the Firſt Power to maintain the natural ſtate of all we ſee, than by ſhewing, that, following this ſame diſpoſition, the Sun could have in progreſs of time put our World into the condition 'tis in, if it had not been more proper to form all the Creatures in an Order altogether contrary to that, which was required by the de-

pendance that now is between them, and to produce each Being in a way, which might ſhew, that as the Author of the World had need of nothing to make all things, ſo he needed no time to bring forth any of the things we admire.

Laſtly, If you conſider, that that Wiſdom, which put the firſt Man into his moſt perfect ſtate from the firſt moment of his Production, did ſubject his Conſervation to the ſame Laws, from which he hath made to depend the formation of thoſe that are born of him, and that, for the right knowledge of the Nature of Man, it would be much more proper to examine the different Changes, which happen in the Seed from the time of Conception, unto the Birth of thoſe that are generated, than to examine the

the miraculous formation of him, whom Omnipotency finiſh'd in beginning him; you will doubtleſs find, that for the well knowing, whether what is taught of the Laws, which conſerve the order of Nature, be true, there is no better way, than to conſider, whether thoſe Laws could have produced the ſame.

I will not examine here, whether what is commonly believed of the ſtability of the Earth, is better explicated by the Hypotheſis of M. *Des Cartes*, than by thoſe which have preceded him.

Neither ſhall I examine, whether it be more true than others; himſelf hath ſaid (as I have already noted) that it may be falſe. And certainly among an Infinity of ways, which God may uſe to make one and the ſame thing, it is difficult to aſſure, which

which that is he hath taken actually. But me thinks, that Men have reaſon to be content, when they have found one of them, which can give an accompt of all the *Phænomena*, and is not contrary to what the H. Scripture and the Church propoſe to us. M. *Des Cartes* hath been ſo ſhy to advance any thing not conform to what *they* declare to us, that he hath expreſly ſubmitted to the one, what he ſeems to have wholly taken out of the other.

Thus whoſoever ſhall read his Writings with the ſame Spirit, wherein he wrote them, will not be in any danger of being deceived, and will be alwayes ready to acknowledge his Errors, as ſoon as thoſe that are to direct his Belief ſhall make him underſtand them. As for me, I am perſwaded, that if we ſhould condemn what

what M. *Des Cartes* hath written touching the manner in which the ſeveral Aſpects of the Sun & the Earth are made, and that upon judging, it would not be a ſufficient ſtability for the Earth, to remain always at reſt in the midſt of all the Celeſtial matter, which is found between the Body of the Moon and it, we ſhould come to determine, that the Circle which M. *Des Cartes* makes all that matter run through in 1. year about the Sun, is contrary to what we ought to believe of the reſt of the Earth; his greateſt Followers, imitating his ſubmiſſion, would ſubmit themſelves firſt of all. For in ſhort, as they know by evident Demonſtrations, not only that 'tis God that is the Cauſe of the motion in the leaſt portion of the Matter, but alſo that it is his Omnipotent hand which directs

and

ordereth it throughout; it would be much more eaſie for them than others., to conceieve, that the ſame Hand can direct the Motions of the Sun, and of all the Celeſtial Matter about the Earth, ſo as it ſhould not receive the leaſt ſhaking from it.

For the reſt, I think I cannot repeat too often, that M. *Des Cartes* hath not pretended, that his Hypotheſis was true in all, and hath even acknowledged, that it was not ſo in certain things. But once more, I eſteem, he had reaſon to think, that it was allowable for Men to make ſuppoſitions, and that they were all receivable, ſo they did ſatisfie all the Appearances, and were not contrary to Religion.

You'l find in ſome of his Letters, that he took much pains, when he was about to advance certain

certain Propoſitions, to know, whether they had been condemned. It is by the Motives of this diſcreet apprehenſion, that he dedicated his Meditations to the Doctors of the *Sorbon*. And in ſhort, it appears in his whole Conduct, that he would not for all the knowledge and Honour of the World, run the hazard of an *Anathema*. I muſt tell you alſo, that I think I know ſome of the beſt Wits, which are much addicted to his Tenets; and I know not one of them, that would not abandon them, if they had been condemned. I doubt, whether the ſame would be done by thoſe that follow *Ariſtotle*, if his Opinions ſhould be condemned anew: I ſay, *anew*, becauſe you know, that they have been ſo by the Laws, and even by a Council: And yet, although nothing

nothing have been changed ſince in the Canons about it, many think they may follow him notwithſtanding. My chief Deſign is not to blame *Ariſtotle*; I intend only to juſtifie M. *Des Cartes*, and I think I have done it ſufficiently, I am,

Reverend Father,

At *Paris*,
Nov. 6. 1669.

Your Humble and

Obedient Servant,

Des FOURNEILLIS.

THE

THE GENERAL SYSTEME OF THE *CARTESIAN PHILOSOPHY:*

By *Francois Bayle*, Dr. of Phyſick at *Tholoſe.*

Engliſhed out of *French.*

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A TABLE of the HEADS of this *SYSTEME.*

I. OF *Metaphysicks.*
II. *Of Logick.*
III. *Of Physiology, in general.*
IV. *Of the Productions in the Bowels of the Earth.*

V. *Of Meteors.*
VI. *Of Sensible Qualities.*
VII. *Of Plants.*
VIII. *Of Animals.*
IX. *Of Man.*
X. *Of the Passions.*
XI. *Of Morals, and the Sovereign Good of Nature.*

THE

THE GENERAL SYSTEME OF THE *CARTESIAN PHILOSOPHY.*

Of METAPHYSICKS.

HE that will have a Metaphyſical certainty of the Exiſtence of things, may with reaſon, and even *ought* to call in queſtion all which the

Senſes repreſent to us, becauſe they do ordinarily deceive us: But whilſt he doubts of the exiſtence of the Objects of the Senſes, he cannot poſſibly doubt that he or that part of himſelf, we call *Soul*, which doubteth and thinketh, exiſts.

And becauſe *Thinking* alone maketh the Soul know its exiſtence, ſhe is convinced, that ſhe is a Subſtance, whoſe Eſſence or Nature is to *Think*, and nothing elſe; and conſequently that ſhe thinks alwayes. Whence it alſo follows, that the Soul is more aſſured of her Exiſtence, than of that of any other thing, and that ſhe knows her ſelf better than any other thing, ſince ſhe cannot diſcover any propriety of it, but ſhe muſt diſcover in her ſelf a new one, that is, the faculty or propriety to know it.

If

If the Soul makes reflection upon the *Idæa's* or Conceptions ſhe hath, ſhe will find one of them, which repreſents to her a Being infinitely perfect, which is *God.* And obſerving that this *Idæa* contains by repreſentation an Infinity of Perfections, ſhe will be conſtrained to acknowledge, that this *Idæa* could not be in her, if this infinitely perfect Being, which ſhe repreſents, had not lodged it there, and conſequently, that this Being, which is *God*, exiſts.

And becauſe this very ſame *Idæa* contains the external Exiſtence of this infinitely perfect Being, which ſhe repreſents, the Soul is obliged, by a new conviction to avow, that Exiſtence belongs to the Eſſence of God, and by conſequence, that he exiſts neceſſarily.

Laſtly, Foraſmuch as the Soul knows, that there is not any neceſſity for her to exiſt to day becauſe ſhe did exiſt yeſterday, ſhe is thence convinced, that ſhe needs to be conſerved: and becauſe Conſervation is nothing but a continual Production, ſhe muſt needs confeſs, that God, to whom alone belongs this Production, exiſts, and that 'tis in vain here to have recourſe to a progreſs *in infinitum*, becauſe the matter in queſtion is the *preſent* Conſervation, the firſt cauſe of which muſt exiſt.

The *Idæa* we have of God, whereby we apprehend him to be a Being ſoveraignly perfect, although it be not complete, becauſe it comprehends not explicitly all that is intelligible of him, yet it is very clear, and very diſtinct, becauſe it clearly ſhews us his

his whole Nature; juſt as we ſay, that a man knows the whole Nature of a Triangle, when he knows a Superficies bounded by three Lines; although he do not know many of its Proprieties, which perhaps will never be all known to the beſt *Geometers*.

Being moſt aſſured, that there is a God, and his Nature being ſuch, that he cannot deceive us, we are certain, that we ſhall never erre in things we know clearly and diſtinctly. Wherefore having clear and diſtinct *Idæa's* of the Corporeal Nature, or of Subſtance in general, and alſo in particular of ſome Bodies which preſent themſelves dayly to our mind by the Senſes; and knowing beſides, that we are not the Cauſes of thoſe *Idæa's*, ſince we often have them againſt our will; we muſt neceſſarily conclude, that

that they are excited *in* us by ſenſible Beings that are *without* us and actually exiſt in the World; and that theſe Beings are really diſtinct from the Soul, becauſe that her Nature is altogether different from theirs; whence it follows that ſhe is Immortal.

And becauſe the *Idea's*, which we have of things corporeal, are often different, we have cauſe to believe, that the Beings which produce them, are different alſo. And becauſe theſe *Idæa's* are ſometimes renewed, after they have ceaſed to be for ſome time, and that we have no reaſon to believe, that a thing which *is* once, ſhould be anihilated, we are obliged to hold that there are Beings, which laſt even when they are not felt; and this is the only means we have to aſſure our ſelves

ſelves of the exiſtence of the *Number* and *Duration* of Senſible Beings.

We are not only aſſured of the Exiſtence of Bodies, but alſo, that there is one, which is more properly ours than all others, becauſe it accompanies us every where, and the Motions made therein excite ſome Thoughts in our Soul, and the Thoughts of our Soul produce reciprocally ſome Motions in the Body. Which convinceth us of the Union there is between the Soul and the Body, which conſiſts not only in their mutual preſence, but in a true *mode*, which in its nature is ſuch, that we cannot comprehend it by our Underſtanding, nor by our Imagination; but we infer it only by the Experiments of the Senſes.

Our Errors proceed from the

ill

ill uſe of our Freedom, in that our Will being in ſome manner of a vaſter extent than our Underſtanding, we do not contain *that* within the Bounds of *this*, but we either judge of things we do not clearly conceive, or we judge of them otherwiſe than we conceive them. For it belongs to the Underſtanding alone, to conceive or to repreſent Objects ſimply, whereas the Judgment and all other determination is an Act of the Will.

The chief perfection of Man conſiſts in the good uſe of his Freedom, and in never judging otherwiſe of things than he conceives them; which is ſo proper to every one, that even thoſe who have their Underſtanding leſs enlightened, may altogether poſſeſs this perfection, foraſmuch as 'tis alwayes in their power to

ſuſpend

ſuſpend their Judgment, that is, to keep themſelves from aſſerting or from denying a thing, of which they have not clear and diſtinct *Idæa's*: which is to be underſtood of thoſe only that belong to the *Inſtruction of the Mind*; for very often we ought not to look for evidence in things which concern the *Conduct of our Life*, and leſs in thoſe which pertain to *Religion*, becauſe knowing evidently, that God cannot deceive us, and that there are infinite things in him, which are above the reach of our Spirit, his Authority ought to produce in us a certainty, which ſurpaſſeth that of the greateſt Evidence.

We may diſtinguiſh three degrees in each ſenſe. In the *firſt*, we are to conſider nothing but the Motion, which the external Objects do immediately cauſe in the cor-

corporeal Organ; and 'tis this alone, we have common with Brutes. The *ſecond* contains all that reſults immediately in our Mind, becauſe it is united to the Corporeal Organ, mov'd and diſpos'd by thoſe Objects: Such are the Sentiments of Heat, of Titillation, *&c.* And this is all we ought to refer to *Senſe*, if we will exactly diſtinguiſh it from the *Underſtanding*. The *third* comprehends all the Judgments, which we have been accuſtom'd to make from our Infancy concerning things that are about us, upon the occaſion of the Impreſſions, that are made in the Organs of our Senſes; and 'tis in theſe Judgments, that our principal Errors do conſiſt; ſo that when we ſay that the certainty of our Underſtanding is greater than that of our Senſes, we mean

nothing

nothing elſe, than that the judgments we form in a riper age, by reaſon of ſome new Obſervations we have made, are more certain than thoſe, we have formed from our Infancy, without having reflected on them.

Of LOGICK.

IT cannot be ſaid, that the Precepts which are commonly taught in Schools, are to be altogether rejected or deſpiſed, ſince they are eſtabliſhed upon very good Reaſons; nor that a great number of Queſtions, which are treated therein, and which at firſt ſight appear odd enough, are of no uſe. For although it be not valuable, to know the truths which they explain, yet the difficulty there is in examining them exerciſeth the Mind, and renders it more able to penetrate and to clear up the Difficulties which are met with in weighty matters; provided, Men uſe this Caution, that

that by too much applying the Mind to thoſe things which ſubſiſt no otherwiſe than in an *Idæa*, they be not taken for real Beings, and ſuch as do exiſt without the Underſtanding.

Thus *Geometricians* make themſelves capable, promptly to explicate the moſt difficult Problemes in thoſe matters which are of uſe in the life of Man, by exerciſing themſelves in the moſt knotty and the moſt abſtract Queſtions of *Algebra*, and by making Magical Squares and other things, which are of no uſe in themſelves.

But, to ſpeak preciſely, no man of good ſenſe, that acts candidly, and labours only to find out Truth, either alone or jointly with others, without any deſign of deceiving them, and without any ground of fearing to be de-

deceived himſelf by any Sophiſm, needs any other Precepts of *Logick*, but theſe four enſuing.

The *firſt* is, never to receive any thing for true, which is not evidently known to be ſuch, that is, never to take in more into our Judgments, than what preſents it ſelf ſo clearly and ſo diſtinctly, that we cannot at all doubt thereof.

The *ſecond*, to divide each of the difficulties, which we diſcuſs into as many ſmall parts as is poſſible, and neceſſary for examining them the better.

The *third*, orderly to conduct our Thoughts, by beginning with the moſt ſimple and the moſt eaſily knowable Objects, and ſo by degrees to aſcend to the knowledge of the more compounded.

The

The *fourth*, to make throughout ſuch complete Enumerations, and ſuch univerſal Reviews, that we be aſſured, we omit nothing.

F *Of*

Of NATURAL PHILOSOPHY.

Of the Syſteme of the World, and the Cauſes of the Diſpoſition and Order of the moſt conſiderable parts thereof.

THE extenſion into length, breadth and thickneſs, is that, we call *Body* or *Firſt Matter*; and whoſoever ſhall attentively conſider the *Idæa* he hath of this Matter, will be convinced, *that*

that a *Vacuum* is impoſſible; *that* Rarefaction is made only by the acquiſition of ſome new Matter, and Condenſation by the loſs of ſome other; *that* the interior *place* of a Body is not different from that Body; *that* the World is indefinite; *that* 'tis repugnant, there be more Worlds than one, although there may be many Bodies that may be inhabited as our Earth is; *that* the Matter of the Heavens and that of things Sublunary are of the ſame kind; Laſtly, *that* a Cubique Foot of *Lead* holds not more Matter than a Cubique Foot of *Cork*.

Diviſibility, Figure, and Impenetrability are the Eſſential Proprieties of Matter. Motion, Light, Colours, *&c.* are its common Accidents. That which Philoſophers call the *Quantity* of a Body, is not the extenſion of that Body

preciſely, but its Extenſion as ſuch, that is, foraſmuch as it may be meaſur'd by ſuch and ſuch a number of Feet, Fathoms, or the like meaſure.

Diviſibility is the moſt fertil of all the proprieties of Matter; 'tis from thence, that the ſeveral Magnitudes and Figures of her parts are derived; and from the different diſpoſition of theſe do proceed all the different Beings, which make up the World. The Matter cannot be actually divided but by Local Motion; and this, being taken *formally*, is nothing elſe but the ſucceſſive application of a Body, in all it hath outwardly, to the ſeveral parts of the Bodies which touch it immediately. *Motion*, which is called *Efficient*, conſiſts in the force or power of moving, which God from the beginning hath put into the

the parts of the Matter, and which he ſtill conſerveth therein in *the ſame* quantity; for which cauſe he is called the *Firſt Mover*. The parts of the Matter, according as they differ in Magnitude and Figure, are called the *Second Cauſes* of this ſame Motion, foraſmuch as they communicate it mutually to one another, or retain it, according as they have the power of it; and that is done following theſe Rules.

1. *All Body which is moved and meets with another quieſcent Body in its way, if it propels it, communicateth to the ſame of its own motion in proportion to its Bulk.*

2. *When the Motion of a Body is made in a curve Line, each of its parts in particular tends always to continue its Motion in a ſtreight Line, and effectually continueth it,*

if it can ſeparate it ſelf from the reſt.

3. *All Body which is moved, and communicateth nothing of its Motion to another Body, which it meets, muſt reflect, that is, looſe its determination, without looſing any thing of its Motion; whence it follows, THAT that Body muſt not reſt, as they ſpeak, in the point of Reflection; and that the direct Motion and the Motion reflected are not contrary, but only their Determinations are ſo.*

4. *When an hard Body falls perpendicularly upon another hard Body which it moveth not, the Reflection muſt be made in the ſame Line, in which the Incidence is made. And when an hard Body falleth obliquely upon another hard Body, which it moveth not, the Reflection muſt be made at equal Angles.*

5. *When*

5. *When a Body passeth obliquely out of one* Medium *into another which it penetrateth more easily, it must be diverted by approaching to the Perpendicular: On the contrary, it must be farther removed from the same, when it penetrateth the second* Medium *more difficultly.*

There is no Motion differing from the *Local*, not even that which is called the Motion of *Generation*; whence it follows, that 'tis useless to admit *Substantial Forms* in Beings meerly Material.

Being assur'd, that God hath put into the Matter, of which the World is composed, a certain quantity of Local Motion, and that he alwayes conserveth the same; we are also assur'd, that, although God had not produced the World all at once, it would

have come to paſs by the Rules of Motion, we have laid down, that in the indefinite Extenſion of the Matter there would have been form'd a great number of *Vortexe* or Whirl-pools, which would have continued to move of themſelves without the ſuccours of any *Intelligence*, and kept always the ſame Situation in reſpect to one another.

It is likewiſe evident, that many parts of the Matter which compoſeth each *Vortex*, of what Figure ſoever you ſuppoſe them, muſt, in hitting one againſt the other, have broken their Angles, until they were made near round, and ſo formed the Matter, which we call the *Second Element*.

The Matter, that is come away from about the parts made round, muſt neceſſarily have acquired a Motion much ſwifter than that of

of the ſaid round ones. Whereunto if you add, that thoſe parts being extreamly ſmall, their ſmalneſs muſt make, that they can change their Figure every Moment, to adapt themſelves to the Figure of the places where they are to paſs; you have that, we call the *Firſt Element.*

The *third* and laſt *Element* is nothing elſe but the Surplus of the parts of the Matter, that are inſenſible, but yet groſſer than thoſe of the firſt and ſecond Element, and which having kept the entangling Figures they had in the beginning, have been proper, more eaſily to be joined many together, and to compoſe great Bodies, as the Planets, than to be made round.

'Tis ſuperfluous to admit other Elements than theſe *three*, becauſe there are no other Bodies in the whole

whole Univerſe, that are ſimple, that is, the Forms of which do not contain any Qualities, that are contrary.

From thence, that all the Matter of each *Vortex* turns round, & ſtriveth to recede from the Center, it muſt come to paſs that the Matter of the *ſecond* Element does recede farther from it, than that of the *firſt*; which conſequently muſt take up the ſpace which is at the Center of every *Vortex*: Whence ſtriving ſtill to recede, it thruſts from all ſides the *ſecond* Element; and adds to its force the impreſſion, which is requiſite to move the *Optique Nerve*, the Motion of which paſſing afterwards into the Brain, giveth the Soul occaſion to produce the Sentiment of *Light*.

As to the *Great* Bodies that were

were formed of the *third* Element, and are called *Planets*, they were to follow the Circular Motion of the *first* and *ſecond*, and to range themſelves in each *Vortex* the nearer to, or the farther from the Center, the more or leſs ſolidity they had; and becauſe the more ſolid are actually gone farther from it, they alſo take up, in making a Revolution, ſo much the longer time, the greater their diſtance is from the Center.

But although the *Planets* do without reſiſtance follow the courſe of the Matter of the Heavens which carrieth them about Circularly, yet we muſt not therefore ſay, that they move altogether as ſwift; whence it comes to paſs that the Matter of the Heavens not being able to continue its courſe in the degree

which

which its ſwiftneſs requireth, by reaſon of the Encounter of theſe great Bodies, it is forced to turn about them, and to make a particular *Vortex*, which maketh them wheel about their Center the ſame way wherein it turns it ſelf.

And becauſe all things continue in the ſtate wherein they are, and by the ſame means, they were put into it; it follows, that the *Vortex* or Syſteme, wherein we are, ſtill maintains and keeps it ſelf by the Rules above declared.

The *Sun* takes up the Center of our *Vortex*, as every Star poſſeſſeth that of ſome other. He turns continually about the Axe of the Ecliptick: And becauſe he is made up of the moſt ſubtile Matter, it may be ſaid, that he is made up only of that of the

first Element; the Heavens, of the ſecond; and the Earth with the Planets, of that of the third: Whence it follows, that there can be no compoſed Bodies, but on the ſurface of theſe laſt.

After the Sun follows *Mercury*, which is diſtant from the Sun 200 Diameters of the Earth, and maketh his Revolution in about 8 Moneths. The *Earth* is diſtant above 600 ſuch Diameters, and maketh her converſion about the Sun in one year, and about her own Center in 24 hours. *Mars* is remote from the Sun about 900 Diameters, and maketh his Revolution in 12 years. *Saturn* is about 6000 Diameters off from the Sun, and finiſheth his period in 30 years.

The Earth carrieth about in her *Vortex* the Moon, which maketh

keth a Revolution in 27 days and ſome hours. All the Matter, which extends it ſelf from the Earth unto the Moon, is call'd the Elementary Matter; and becauſe this Matter contains many parts, which are mov'd much ſwifter than others, 'tis conſequent that all are unequally determin'd to recede from the Center of the Motion; and that thoſe, which move ſwifteſt, receding from it with more force than the reſt, are able to beat them downwards; which maketh ſome appear lighter, and others heavier.

It cannot be doubted, but that the Syſteme, in which we are, is ſuch as hath bin declared, ſince of ſo many, which Philoſophers have fancied, there is none but this, which agrees perfectly with that, delivered by *Moſes*. Beſides that

that therein we find, in a very natural and very ſimple motion, not only the Cauſes of the general *Phænomena*, as are the Direction, Station and Retrogradation of the Planets, of the Motion of the Spots of the Sun; of the Motion of the Planets about their Center, of the Viciſſitudes of Days and Nights; and of the Diverſity of the Seaſons, but alſo of the Flux and Reflux of the Sea, of all the Proprieties obſerved in the Magnet, and in ſhort, of all the Appearances in the particular Bodies.

Of all the Syſtemes there is none, that deſerveth ſo much to be rejected, as that of *Ptolomy*. For, beſides that from the Aggregate of all the parts thereof, there reſults a Whole that is monſtrous, it is not able to give an accompt, why *Venus* appears ſome-

ſometimes increaſing, and ſometimes full; why *Mars*, *Jupiter* & *Saturn*, are alwaies in the lower part of their Epicycle at the time when they are retrograde; why the *Moon* reſpects us alwayes from the ſame ſide; why *Saturn* appears to us under different Shapes, now round, then oval; nor give a reaſon of many Appearances more.

OF

Of the PRODUCTIONS, *made in the Bowels of the Earth.*

THE Diverſity of the Pores of the Earth is the Cauſe, that the Matter of the *firſt* Element, paſſing through them, taketh the Form of ſo many ſeveral Juices, Salts, and Oyles, of which are afterwards formed all the Metals and Minerals, which are found in the Bowels of the ſame.

The *Magnet* hath the propriety to draw Iron, or Iron to draw the Magnet, only from this Cauſe,

that the Pores of them are ſo diſpoſed, that the ſtriate or channell'd Matter, (as the Philoſopher calls it) which comes from the Poles of the Elementary Maſs, and continues its way thorow the Pores, which are parallel to the Axe of the Earth, paſing more eaſily through the pores of the Loadſtone and of Iron, than through thoſe of all the other Bodies, drives away by this means all the Air met with between both: And becauſe this Air finds no place to paſs into (becauſe all is full) but into that, which the one or the other of theſe two Bodies quitteth, there is a neceſſity, that the Iron ſhould be thruſt towards the Loadſtone, or the Loadſtone towards the Iron.

The Sea furniſhes Water to all Foun-

Fountains; those that are on the tops of Mountains, are formed of Waters, that are reduced into Vapours by the heat, which is found in the Entrails of the Earth.

The subterraneous Fires differ nothing at all from those that are kindled in our Chimneys. They come from this, that where there are Mines of *Sulphur* or *Bitumen*, there are raised Exhalations, which lighting upon subterraneous Cavities, fasten to the Roofs, as Soot does to the inside of our Chimneys, and there make a kind of Crust, which hath a great disposition to take Fire; and which taketh flame actually, either by the attrition of its parts, which their weight loosens from one another,

or by the fall of ſome great Stone, which tumbling down from the top of the Vault, ſets it on fire, as the Peſtle doth Gunpowder, when being very dry, 'tis too violently ſtamped.

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of

Of METEORS.

WInds do principally come from nothing but the dilatation of Vapours. And this dilatation depends from the preſence of the Sun, or from the heat he hath left in the Earth, or in the Waters. When the Sun riſeth, we feel an Eaſterly wind; when he ſetteth, a Weſterly; about Noon, a Northerly; and about Midnight, a Southerly. Men ſeldom fail to find theſe four ſorts of Wind every day upon the great Seas; but they are not in the ſame order obſerv'd upon Land, by reaſon of the Mountains, and of the variety of Climates, which hinder it.

Mists and *Clouds* are nothing else but the same Vapours, that made the Winds, which having lost their agitation, stop in great number in certain places, and thereby hinder the action of the Rays of Light.

Rain is nothing else, but the same Vapours, that made the Clouds, which are converted into many little drops of Water by the action of the Air, which a wind hath carried upwards after it had been considerably heated near the Earth.

The parts of the Clouds, which meet only with cold Air to pass through, after that they are loosned, do come unto us in the same state, and by this means do make that Substance, we call *Snow*.

Hail

Hail is nothing elſe but ſome portions of a Cloud, which having been melted in part, do meet with a cold Air, that congealeth them afreſh.

Thunder depends from this, that in the Air there are divers Stories of Clouds, of which the higher fall upon the lower; the Air, driven out from between them, being determined to produce a ſound for the ſame reaſon, that another Air produces one in Muſical Organs.

Lightning proceeds ordinarily from this, that the Exhalations, which are between two Clouds, whereof the one falls upon the other, are ſo preſſed, that there is ſome part of thoſe Exhalations, which ſwims but in the ſole Matter of the firſt Element, and conſequently

ſequently taketh the form of Fire.

A *Thunderbolt* is nothing elſe but a portion of theſe kindled Exhalations, which moveth down to the Earth, where it muſt needs ſtrike high Bodies, rather than lower ones; and produce ſo many different and wondrous Effects, as we ſee, according to the Nature of the Exhalations, of which this Thunder-bolt is formed.

A *Rain-bow* is nothing elſe but many drops of Rain, which receiving the Rayes of the Sun, break them many different ways, and which, after they have thus broken them, return them to our Eyes with the modifications requiſite to excite in us all the ſentiments of the Colours, we perceive in this Meteor.

Of

Of SENSIBLE QUALITIES.

HA*rd* Bodies are thoſe, all whoſe parts are at reſt one by another.

Liquid Bodies are ſuch as have all their parts moving ſeparately; whence it comes, that theſe latter have the propriety of diſſolving the former. And if a Liquid is unable to diſſolve an Hard Body, or if it have the force to diſſolve one rather than another, *that* proceeds from hence, that its parts are more or leſs groſs or agitated, and from this that the configuration of the Pores of the Bodies, which

which are to be diſſolved ; is different.

All the diverſities of Liquors conſiſt in the different ſizes and ſhapes of their parts. Thoſe that have irregular and entangling figures, do compoſe Liquors that are called *Fat* ; and thoſe, whoſe figures are very well poliſh'd and very ſmooth, make thoſe, we call *Lean*. All Liquors are kept in motion by the matter of the firſt and ſecond Element, which ſlides into their Pores, and moveth alwayes of it ſelf, ever ſince it was firſt put in motion in the beginning of the World.

The conſtrained Figure, given to the Pores of *Hard* Bodies when we bend them, is the *diſpoſitive* Cauſe of the force they have of redreſſing themſelves, and the Mat-

Matter of the *ſecond* Element, paſſing through theſe Pores, is the *Efficient* Cauſe of the ſame. The *Suppleneſs* of hard Bodies conſiſteth in the texture and connection of their parts. Their *Fragility* in that their parts do but immediately touch, without being otherwiſe locked in with one another.

The *Heat* of hot Bodies conſiſts in the agitation of all their inſenſible parts about their own Center; whence it follows, that the greater this agitation is, the ſtronger is the heat, and conſequently there can be nothing hotter than a Flame, there being nothing more agitated, as Experience confirms it. All the diverſities of Flames proceed from this, that the parts which compoſe them are more or leſs groſs,

and

and consequently more or less capable to agitate the Bodies, which are the Subject of their Action. The propriety of Heat is always to dissipate, and never to congregate but by accident. Forasmuch as it consists in Motion, it must rarifie certain Bodies, and condense others at the same time, according as the parts of those Bodies are equal or unequal, and diversly ranged and disposed.

Cold consists in whatsoever can make an hot Body lose that kind of Motion wherein Heat consists; and because one Body cannot take from another Body the Motion it hath, without losing the same it self, it follows from thence, that whatever Body refrigerates another, must grow hot it self.

Odors

Odors in ſcenting Objects are nothing elſe than the inſenſible parts of the ſame, which being ſever'd from one another ſwim up and down in the Air, and being taken in together with the inſpired Air, excite a Motion in the extremities of the Olfactory Nerves; which they do ſo many ſeveral ways, as we find ſeveral kinds of Smells.

Taſts in ſavoury Bodies conſiſt only in the parts of the ſame, foraſmuch as they are ſubtil enough, and ſufficiently agitated to penetrate the Pores of the Tongue, and to move the Nerves ſerving for the Organ of Taſt. All the diverſity of Taſts depends upon the ſize, ſhape, and motion of the Savoury Bodies.

Sound is double, the one from the

the Body reſonant, which is called the primitive cauſe of Sound; and the other from the *Medium*, which ordinarily is the Air. The Sound of this latter conſiſts only in a ſimple tremulous Motion of the Air, which ſtriketh our Ear, and exciteth the Organ of Hearing. The Sound from the reſonant Body conſiſts in *general* in the force it hath to excite that trembling in the Air; but in *particular*, this force depends upon many Modes of Being, which are very different, as appears in Bells and ſtrings of Inſtruments. A *ſharp* ſound comes from thence, that the trepidations of the Air do cloſely follow one upon another. The *grave*, that thoſe Motions of the Air are leſs frequent. The Conſonancies and Diſſonancies depend upon this, that the impreſſions, which ſeveral

ral reſonant Bodies make in the Air at the ſame time, do meet, or not meet at all.

Light in *luminous* Bodies conſiſts in an actual Motion of all their parts; and in *tranſparent* Bodies, it depends upon this, that the Matter of the ſecond *Element* which is in their Pores, and which reacheth to our Eyes, is thruſt forward by the parts of the luminous Body; whence it follows, 1. That it is not ſo much a Motion, as an inclination to Motion. 2. That it paſſeth in an inſtant to all ſorts of diſtances. 3. That it is nothing material in the *Medium*, through which it paſſeth, and that it doth but mark, in what manner the Luminous Body acts againſt that, which it enlightens. 4. That many Lights do not confound one another. 5. That Light

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Light muſt refract and reflect, and, in ſhort, have all thoſe proprieties, that are obſerved in it.

Colours in general are nothing elſe, but Light it ſelf modified by the Surface of the Bodies, we call colour'd. The *White* Colour particularly conſiſts in this, that the Superficies of the white Body is aſperated by innumerable ſmall Surfaces of an almoſt ſpecular nature, which are ſo placed, that ſome looking this way, and ſome that way, they yet reflect the Rays of Light falling on them, not towards one another, but outwards to our Eyes.

The *Black* conſiſts in this, that the Surface of the Black Body is aſperous after ſuch a manner, that it altogether deads the Rays of Light which fall upon it, and keeps them from reflecting back

again

again to the Spectators eyes. All other Colours consist in this, that the Superficies of the Bodies thus coloured are in such a manner unequal, that the little Globes of the second Element, which enter into the composition of the Rays, encountring them, do reflect, losing a part of their direct Motion, and acquiring in stead of it somewhat of a Circular Motion. And 'tis also in the several proportions, to be met with between these two Motions, that all the several Colours do consist: And because these Proportions may be changed a thousand different wayes, 'tis no wonder we see so many different Colours.

The *Humors* which compose our Eyes, are contrived by Nature to determine the Rayes, that come from one and the same point

of the Object, to re-unite in one and the ſame point of the *Retina*; whence 'tis, that it may be ſaid, that there is formed a true Image of the Object on the bottom of the Eye. Yet this Image doth not conſiſt in a reſemblance to the Object, but only in this, that it is capable to give to the Soul an occaſion to perceive all the ſeveral Qualities of the Objects, which it relateth to; which it doth by the ſimple Motions wherein it conſiſts.

Although one only Object imprints two Images at once in the two Eyes, yet we do not therefore ſee double, becauſe the Eyes are not the immediate Organs of Sight, but the Brain alone, in which the two Impreſſions made in the Eyes do

do re-unite by the intervention of the Sympaticall ſtrings of the Optick Nerves, before the Soul perceives it.

Of PLANTS.

THE form of *Plants* conſiſts in the particular texture of their Fibres, and in the ſize, ſhape, and diſpoſition of the parts which compoſe them: Whence do reſult in Plants ſuch Channels and Tubes, as are fit to receive thoſe Juices, which are proper for them, and no other; and the Matter of the firſt and ſecond Element is determined to make thoſe Juices to run, to be variouſly agitated and fermented, to concoct and prepare them, that they may ſerve, according to their ſeveral parts, for Matter to nouriſh the Wood, Pith, and Bark, and to produce Leaves,

Leaves, Flowers, and Fruits.

The Viciſſitude of Day and Night, of Winds warm and cold, dry and moiſt, contributeth much to cauſe the Juice, which from the Root of the Plant hath paſſed into the Bark, to be attenuated, to run with more force, to jelly and fix, and to run afreſh: As the viciſſitude of the Seaſons of the Year maketh, that this Juice runs more plenteouſly ſometimes to the Body and Branches, and ſometimes towards the Roots.

When this Juice is too copious, it relaxeth the texture of the Fibres of Plants, and ſuffocates their natural Heat, which depends upon the quantity of the firſt Element, agitating that Juice, whoſe force ceaſeth, aſſoon as the Interſtices of the Fibres do conſiderably change their natural ſtate.

If this Juice be in too ſmall a quantity, the Plant is dried up little by little; but if it be too copious, or if the ſhapes of its parts are very different from thoſe of the Pores of the Plant, it ſpoyles and deſtroyes the woof of the fibres in the Bark of the Roots, or maketh it degenerate into another Plant, eſpecially in its firſt riſe, by changing this ſame texture, and thereby making it fit to receive the Juice, by which that Plant is nouriſh'd, into which 'tis made to degenerate. Whence it is, that certain Seeds are infallibly corrupted, when they are caſt into certain Earths; and that others degenerate in them; as Wheat ſometimes produces Tares, or Barley, or Oats.

It is not at all neceſſary, that there ſhould be a *Soul* in Plants, to

to cauſe the Juice, which ſerveth them for nouriſhment, to be diſtributed into all the parts to increaſe them, and to form Flowers and Fruits; no more than there needs a Soul, to make Liquors riſe to a conſiderable height in filtration, or in a little Tube of Glaſs, againſt their own weight, & variouſly to fix themſelves according to the diverſity of their parts, and of the Channels through which they run. Plants have their life potentially, or in the firſt act, as the Schools ſpeak, by the ſole contrivance and ſtructure of their parts; but they live actually when the Juice runs through their Pores, *&c.*

Of ANIMALS.

THE Form of *Animals*, as that of Plants, conſiſts in the Magnitude, Figure and Structure of the parts, of which they are compoſed; with this difference, that the nature of Animals is of a more complicated and more excellent contrivance, by reaſon of the manifold and more particular functions they have need of for their conſervation. For, they not being fixed to the Earth, as Plants are, to draw thence their nouriſhment, it was requiſite, that they ſhould be able to move to and fro, for finding their neceſſary food, and that they ſhould be compoſed ſo artificially,

ficially, that the little particles, which exhale out of Bodies, or the Light which reſults thence, ſtriking certain Organs, might be able to determine them to purſue after that, which ſhould be convenient for them, & to flee from, or to repel that, which ſhould be noxious to them.

Foraſmuch as moſt of the Motions, that are obſerv'd in Animals, are accompanied in us with ſome knowledge, it hath been believed, that there was in Animals a principle of knowledge, which is called the *Senſitive Soul*, that produced them; without conſidering, that the ſame Motions are very often made in us without our Soul's contributing any thing to them, ſeeing ſhe doth not think on them, and that at times they are made againſt her will. And thoſe can hardly

diſabuſe themſelves, who do not know, *that* God hath put motion into Matter in general, *that* he hath contriv'd the Bodies of Animals after a certain way, and that he hath eſtabliſh'd certain Rules of Motion. But thoſe, that have this knowledge, obſerving that they ſee nothing but Motion in brute Animals, they find the true cauſe of it in the general ſtate of the world, and the determination in the particular ſtructure of the the Body of Brutes, and they know by the Laws of the Mechanicks the neceſſity there is, it ſhould be done in ſuch a manner.

What concerns the Nutrition of Animals; the Food, they have ſwallow'd, is digeſted and changed into Chyle in the Stomach by a gentle fermentation, which is wrought by the mixture made of the

the Aliments, and Spittle, and the acid Juice, which is diſtill d into the Stomach, and of the remainder of the precedent Food. There is alſo made in the ſmall Inteſtines another fermentation, by the means of the Gall, and the Pancreatique Juice, which maketh the Chyle more fluid, and cauſeth the good to be more eaſily ſeparable from what is uſeleſs and groſs.

The Chyle is changed into Bloud in the Heart by a ſpecial fermentation, which is there made by the means of a Fire that ſhineth not, and of the fermented Bloud, which remains in the Heart; to which the mixture of the *Lympha* contributeth not a little, which comes from above, and that of the Gall, which comes from beneath, together with the Bloud, which is conveyed

ed by the *Vena Cava* into the right Ventricle of the Heart. The Ears of the Heart, (two Muſcles of an admirable ſtructure, which ſhews their uſe) do propel the Bloud in the Ventricles of the Heart, when this relaxeth or ſubſideth; and the Heart, cloſing it ſelf after the Bloud is rarified and fermented, thruſts it towards all the parts of the Body by the Arteries (which then make the motion called the *Pulſe*) for Nutrition. But what ſticks not to the parts, is carried from the Lungs to the Heart by the *Venal Artery*, and from the reſt of the Body by the *Vena Cava*.

The moſt ſpirituous part of the Bloud is carried to the Brain, where the Spirits are ſeparated from it to ſerve for the functions, call'd *Animal*; whence flowing into the Nerves that paſs to the Organs

Organs of Senſe, and filling them, they keep their fibres tenſe whilſt the Animal is awake. Hence it is, that the impreſſions of the Objects can be tranſmitted into the Brain, and there change the diſpoſition of the extremities of the Nerves, that are diſtributed in certain Muſcles, and determine the Spirits to flow there, to make them ſwell, and to move the Members, to which theſe Muſcles are fixed.

And becauſe there may be an infinite variety in the Impreſſions, made by the Objects upon the Senſes, there may alſo be an innumerable variety in the determinations of the Spirits to flow into the Muſcles, and by conſequence an infinite variety in the Motions of Animals; and that the more, becauſe there is a greater variety of parts, and more contri-

contrivance and Art in the ſtructure.

During *Sleep*, the Nerves of the Organs of the Senſes not being full, nor their fibres tenſe, the impreſſions of the Objects, unleſs they be very violent, are not tranſmitted to the Brain, to determine there any Motion.

There are five outward Senſes, and they all receive the impreſſion of the Objects by mediate or immediate contact. The groſſeſt Senſe is called the *Touch*, to which all the Membranous and Nervous parts ſerve for Organ.

The *Taſt* hath it Seat in that woof of Nervous Filaments which is ſpred over the Tongue and Palat; but chiefly upon the end of the Tongue.

The *Smell* hath its Reſidence in that fine Membrane which is extended

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The *Hearing* hath for its Organ ſmall Nerves, which end in the extremities of that Membrane, we call the *Tympanum* or Drum.

The *Sight* hath for its Organ the *Retina*, more particularly, the other parts of the Eye making the Rayes of Light or Colours which come from divers points of the Objects, to affect divers points of the *Retina*.

There are three inward particular Senſes; that of *Thirſt*, which hath its Seat in the Throat; that of *Hunger*, in the Stomach; that of the *Paſſions*, in the Heart.

The Senſe, called the Common Senſe, hath its Seat in the Brain; and becauſe the Animal

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Motion, and the Functions of all the Senſes depend upon the Spirits that come from the Bloud, 'tis therefore that the *Scripture* ſaith, that the *Soul of the Beaſts is in the Bloud.*

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of

Of MAN.

MAN is made up not only of a Body, which, as that of Animals, hath a peculiar ſtructure of Organs, wherein conſiſts, in ſome ſenſe, the Form of this Body; but alſo of a Soul, which is the true and eſſential Form of Man, or of the Humane Body as ſuch, after the manner that *Ariſtotle* taketh this Word *Form* in his Firſt Book of Generation, Chap. 10.

By reaſon of the Union, which

is between the Soul and the Body, the Impreſſions, which the Objects make upon the Senſes, are cauſe that there do reſult in the Soul certain Senſations. And not only the Soul perceiveth many Motions that are made in the Body, but ſhe alſo is able to produce or to hinder them. 'Tis true that this is only done by variouſly determining the Motion of the Animal Spirits by her Thoughts.

Man hath as many Exteriour and Interiour Senſes as Animals, but with this difference, that in theſe, all the Action of the Senſes conſiſts in the Motion of the Corporeal Organ, whereas in Man the motion of the Organ is accompanied with a Thought or Perception of the Soul

Soul, which is called the Sentiment of Sound, of Light, of Colour, &c.

Of the Passions

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Of the PASSIONS.

MAn hath alſo his *Paſſions*, which are perceptions of the Sentiments or Commotions of the Soul, which are referred particularly to her, and which are cauſed, entertained, and fortified by ſome Motion of the Spirits.

Admiration is a ſudden ſurpriſal of the Soul, which maketh that ſhe is carried, with attention to conſider the Objects, that ſeem rare and extraordinary to her.

Love

Love is a perception or motion of the Soul, cauſed by the motion of the Spirits, inciting her to join her ſelf by the Will to the Objects, which appear agreeable to her.

Hatred is a motion cauſed by the Spirits, which inciteth the Soul to a ſeparation from the Objects, which preſent themſelves as diſagreeable or hurtful to her.

Deſire is an agitation of the Soul cauſed by the Spirits, which diſpoſeth her to will future things which ſhe repreſents to her ſelf as ſutable and beneficial.

Joy is an agreeable commotion of the Soul, cauſed by the enjoyment ſhe finds in a good, which the Impreſſions of the Brain repreſent to her as hers.

Sadneſs is an unpleaſing Languor, cauſed by the Incommodities which the Soul receiveth of the Evil or Defect, which the Impreſſions of the Brain repreſent to her as concerning her ſelf.

Theſe *ſix* Paſſions are primitive, and all the *Genus's*, whoſe *Species* all the others are.

According to the Inſtitution of Nature, all the Paſſions refer to the Body, and are not given to the Soul, but forasmuch as ſhe is joined to *It*. So that their natural uſe conſiſts only in this, that they fortifie and make laſting in the Soul thoſe Thoughts, which 'tis good ſhe ſhould conſerve, and by which ſhe is incited to conſent and to contribute to the Actions that may ſerve to keep the Body, or to render it in ſome manner more perfect: As alſo all the E-

vil,

vil, which they can occaſion, conſiſts in that they ſtrengthen and entertain thoughts more than needs; or elſe, that they keep others, which it is not good to indulge to.

Of MORALITY.

Of the Soveraign *Natural Good.*

IF we consider Goodness with relation to our selves, the *Soveraign Good* of the Soul of every one in particular, consists in a firm and constant will to do well, and in the contentment produced thereby. And 'tis herein, that all Virtues do consist.

Justice, for example, is nothing but a constant Will to give to

to every one what we judge to belong to him.

Boldneſs, nothing but a conſtant Will to execute things dangerous, when we believe them to be the beſt.

Humility, nothing but a conſtant Will, never to prefer our ſelves before others, and to think, that others have their Free Will as well as we, & can uſe it as well as we, *&c.* Now 'tis this alone, which deſerveth Praiſe and Honour; 'tis from hence alone, that the greateſt and moſt ſolid Contentment of Life reſults, and conſequently wherein the *Soveraign Good* conſiſts.

There are two ſorts of Indifference, which appertain to humane Liberty: *One* is from the Ob-

Object's part, and this is not Eſſential; on the contrary we are never more free, than when we are leſs indifferent. The *other* conſiſts in the real and poſitive faculty, we have to determin our ſelves to the one or the other of two Contraries; and this is always found in the Will, and agreeth perfectly well with all the impreſſions, that are cauſed in her from God's part, although we do not conceive, how this agreement is made.

The Angels, and the Saints in Heaven, do love God freely; but their Liberty conſiſts not, as Ours doth, in a poſitive faculty to determin themſelves to the one or the other of two Contraries; but only in this, that ſeeing

ſeeing God Soveraignly Good, they love him in ſuch a manner, that they feel not any exteriour force, conſtraining them thereto.

FINIS.

AAN.e.14 A

DISCOURSE

Written to a

LEARNED FRIER,

BY

M. *DES FOURNEILLIS*;

Liber SHEWING, *Bibliotheca*

That the SYSTEME of M. *DES CARTES*, and particularly his Opinion concerning BRUTES, does contain nothing dangerous; and that all he hath written of both, seems to have been taken out of the First Chapter of *GENESIS*. *Edinensis*

To which is annexed the

SYSTEME GENERAL

Of the same

CARTESIAN PHILOSOPHY.

P. J. N.

By *Francis Bayle*, Dr. of Physick at *Tholose*.

Englished out of *French*.

LONDON,
Printed, and are to be sold by *Moses Pitt* at the *White Hart* in *Little Britain*, 1670.

the Body reſonant, which is called the primitive cauſe of Sound; and the other from the *Medium*, which ordinarily is the Air. The Sound of this latter conſiſts only in a ſimple tremulous Motion of the Air, which ſtriketh our Ear, and exciteth the Organ of Hearing. The Sound from the reſonant Body conſiſts in *general* in the force it hath to excite that trembling in the Air; but in *particular*, this force depends upon many Modes of Being, which are very different, as appears in Bells and ſtrings of Inſtruments. A *ſharp* ſound comes from thence, that the trepidations of the Air do cloſely follow one upon another. The *grave*, that thoſe Motions of the Air are leſs frequent. The Conſonancies and Diſſonancies depend upon this, that the impreſſions, which ſeveral

ral reſonant Bodies make in the Air at the ſame time, do meet, or not meet at all.

Light in *luminous* Bodies conſiſts in an actual Motion of all their parts; and in *tranſparent* Bodies, it depends upon this, that the Matter of the ſecond *Element* which is in their Pores, and which reacheth to our Eyes, is thruſt forward by the parts of the luminous Body; whence it follows, 1. That it is not ſo much a Motion, as an inclination to Motion. 2. That it paſſeth in an inſtant to all ſorts of diſtances. 3. That it is nothing material in the *Medium*, through which it paſſeth, and that it doth but mark, in what manner the Luminous Body acts againſt that, which it enlightens. 4. That many Lights do not confound one another. 5. That Light

Light muſt refract and reflect, and, in ſhort, have all thoſe proprieties, that are obſerved in it.

Colours in general are nothing elſe, but Light it ſelf modified by the Surface of the Bodies, we call colour'd. The *White* Colour particularly conſiſts in this, that the Superficies of the white Body is aſperated by innumerable ſmall Surfaces of an almoſt ſpecular nature, which are ſo placed, that ſome looking this way, and ſome that way, they yet reflect the Rays of Light falling on them, not towards one another, but outwards to our Eyes.

The *Black* conſiſts in this, that the Surface of the Black Body is aſperous after ſuch a manner, that it altogether deads the Rays of Light which fall upon it, and keeps them from reflecting back again

again to the Spectators eyes. All other Colours consist in this, that the Superficies of the Bodies thus coloured are in such a manner unequal, that the little Globes of the second Element, which enter into the composition of the Rays, encountring them, do reflect, losing a part of their direct Motion, and acquiring in stead of it somewhat of a Circular Motion. And 'tis also in the several proportions, to be met with between these two Motions, that all the several Colours do consist: And because these Proportions may be changed a thousand different wayes, 'tis no wonder we see so many different Colours.

The *Humors* which compose our Eyes, are contrived by Nature to determine the Rayes, that come from one and the same point

of the Object, to re-unite in one and the ſame point of the *Retina*; whence 'tis, that it may be ſaid, that there is formed a true Image of the Object on the bottom of the Eye. Yet this Image doth not conſiſt in a reſemblance to the Object, but only in this, that it is capable to give to the Soul an occaſion to perceive all the ſeveral Qualities of the Objects, which it relateth to; which it doth by the ſimple Motions wherein it conſiſts.

Although one only Object imprints two Images at once in the two Eyes, yet we do not therefore ſee double, becauſe the Eyes are not the immediate Organs of Sight, but the Brain alone, in which the two Impreſſions made in the Eyes do

do re-unite by the intervention of the Sympaticall ſtrings of the Optick Nerves, before the Soul perceives it.

Of PLANTS.

THE form of *Plants* conſiſts in the particular texture of their Fibres, and in the ſize, ſhape, and diſpoſition of the parts which compoſe them: Whence do reſult in Plants ſuch Channels and Tubes, as are fit to receive thoſe Juices, which are proper for them, and no other; and the Matter of the firſt and ſecond Element is determined to make thoſe Juices to run, to be variouſly agitated and fermented, to concoct and prepare them, that they may ſerve, according to their ſeveral parts, for Matter to nouriſh the Wood, Pith, and Bark, and to produce Leaves,

Leaves, Flowers, and Fruits.

The Viciſſitude of Day and Night, of Winds warm and cold, dry and moiſt, contributeth much to cauſe the Juice, which from the Root of the Plant hath paſſed into the Bark, to be attenuated, to run with more force, to jelly and fix, and to run afreſh: As the viciſſitude of the Seaſons of the Year maketh, that this Juice runs more plenteouſly ſometimes to the Body and Branches, and ſometimes towards the Roots.

When this Juice is too copious, it relaxeth the texture of the Fibres of Plants, and ſuffocates their natural Heat, which depends upon the quantity of the firſt Element, agitating that Juice, whoſe force ceaſeth, aſſoon as the Interſtices of the Fibres do conſiderably change their natural ſtate.

If this Juice be in too ſmall a quantity, the Plant is dried up little by little; but if it be too copious, or if the ſhapes of its parts are very different from thoſe of the Pores of the Plant, it ſpoyles and deſtroyes the woof of the fibres in the Bark of the Roots, or maketh it degenerate into another Plant, eſpecially in its firſt riſe, by changing this ſame texture, and thereby making it fit to receive the Juice, by which that Plant is nouriſh'd, into which 'tis made to degenerate. Whence it is, that certain Seeds are infallibly corrupted, when they are caſt into certain Earths; and that others degenerate in them; as Wheat ſometimes produces Tares, or Barley, or Oats.

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Soul, which is called the Sentiment of Sound, of Light, of Colour, &c.

Of the PASSIONS.

MAn hath alſo his *Paſſions*, which are perceptions of the Sentiments or Commotions of the Soul, which are referred particularly to her, and which are cauſed, entertained, and fortified by ſome Motion of the Spirits.

Admiration is a ſudden ſurpriſal of the Soul, which maketh that ſhe is carried, with attention to conſider the Objects, that ſeem rare and extraordinary to her.

Love

Love is a perception or motion of the Soul, cauſed by the motion of the Spirits, inciting her to join her ſelf by the Will to the Objects, which appear agreeable to her.

Hatred is a motion cauſed by the Spirits, which inciteth the Soul to a ſeparation from the Objects, which preſent themſelves as diſagreeable or hurtful to her.

Deſire is an agitation of the Soul cauſed by the Spirits, which diſpoſeth her to will future things which ſhe repreſents to her ſelf as ſutable and beneficial.

Joy is an agreeable commotion of the Soul, cauſed by the enjoyment ſhe finds in a good, which the Impreſſions of the Brain repreſent to her as hers.

Sadneſs is an unpleaſing Languor, cauſed by the Incommodities which the Soul receiveth of the Evil or Defect, which the Impreſſions of the Brain repreſent to her as concerning her ſelf.

Theſe *ſix* Paſſions are primitive, and all the *Genus*'s, whoſe *Species* all the others are.

According to the Inſtitution of Nature, all the Paſſions refer to the Body, and are not given to the Soul, but foraſmuch as ſhe is joined to *It*. So that their natural uſe conſiſts only in this, that they fortifie and make laſting in the Soul thoſe Thoughts, which 'tis good ſhe ſhould conſerve, and by which ſhe is incited to conſent and to contribute to the Actions that may ſerve to keep the Body, or to render it in ſome manner more perfect: As alſo all the Evil,

vil, which they can occaſion, conſiſts in that they ſtrengthen and entertain thoughts more than needs; or elſe, that they keep others, which it is not good to indulge to.

Of MORALITY.

Of the Soveraign *Natural Good.*

IF we consider Goodness with relation to our selves, the *Soveraign Good* of the Soul of every one in particular, consists in a firm and constant will to do well, and in the contentment produced thereby. And 'tis herein, that all Virtues do consist.

Justice, for example, is nothing but a constant Will to give to

to every one what we judge to belong to him.

Boldneſs, nothing but a conſtant Will to execute things dangerous, when we believe them to be the beſt.

Humility, nothing but a conſtant Will, never to prefer our ſelves before others, and to think, that others have their Free Will as well as we, & can uſe it as well as we, *&c.* Now 'tis this alone, which deſerveth Praiſe and Honour; 'tis from hence alone, that the greateſt and moſt ſolid Contentment of Life reſults, and conſequently wherein the *Soveraign Good* conſiſts.

There are two ſorts of Indifference, which appertain to humane Liberty: *One* is from the Ob-

Object's part, and this is not Eſſential; on the contrary we are never more free, than when we are leſs indifferent. The *other* conſiſts in the real and poſitive faculty, we have to determin our ſelves to the one or the other of two Contraries; and this is always found in the Will, and agreeth perfectly well with all the impreſſions, that are cauſed in her from God's part, although we do not conceive, how this agreement is made.

The Angels, and the Saints in Heaven, do love God freely; but their Liberty conſiſts not, as Ours doth, in a poſitive faculty to determin themſelves to the one or the other of two Contraries; but only in this, that ſeeing

ſeeing God Soveraignly Good, they love him in ſuch a manner, that they feel not any exteriour force, conſtraining them thereto.

FINIS.